

lack of an RCT makes formal technology assessment vs. alternative treatment (e.g., best supportive care [BSC]) challenging. In such instances, naïve indirect comparison based on historical controls is typically employed. We present a method for estimating outcomes for untreated patients when appropriate historical controls are not available, by using data from non-responders in an uncontrolled trial. **METHODS:** Ofatumumab was licensed for fludarabine- and alemtuzumab-refractory chronic lymphocytic leukaemia (FA-Ref CLL) based on results of an uncontrolled trial (Hx-CD20-406). To evaluate the cost-effectiveness of ofatumumab vs. BSC from the UK National Health Service perspective, a partitioned survival analysis model was developed. Progression free survival (PFS) and overall survival (OS) for ofatumumab were estimated by fitting Weibull survival functions to failure time data for all FA-Ref patients in Hx-CD20-406. Following a literature search, no suitable historical control representing BSC could be identified; therefore hazard ratios for PFS and OS for BSC vs. ofatumumab were estimated by fitting Cox regression models to data for non-responders vs. all FA-Ref patients. Costs and utilities were taken from both published and unpublished sources. **RESULTS:** BSC patients (approximated by non-responders) were estimated to achieve 4.7 months PFS, 11.3 months OS, 0.50 QALYs, and expected lifetime costs of £4,876. Ofatumumab patients were estimated to reach 6.5 months PFS, 17.9 months OS, 0.77 QALYs, with expected lifetime costs of £43,828. **CONCLUSIONS:** The novel approach presented permits a practical alternative for estimating cost-effectiveness when neither an RCT nor appropriate historical control can be identified. Further research should be conducted using established data sets to validate the methodology, and to address potential limitations, e.g. unobserved differences between treatment groups, and potential benefits of treatment in patients classified as non-responders.

PMC3

A NOVEL APPROACH TO MATCHING ADJUSTED INDIRECT COMPARISON ANALYSIS USING COMMON SAS 9.2 PROCEDURES

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OBJECTIVES: While randomized control trials (RCT) are the gold standard for drug approval, there is often a lack of data directly comparing different treatment options. An indirect comparison of the treatment effects may serve as a proxy for a head-to-head RCT, however, naively comparing treatments using published trial data without adjusting for distribution differences in patient characteristics and prognostic factors can result in misleading conclusions. A novel matched-adjusted approach to indirectly compare absolute survival estimates (median overall survival (OS) or progression free survival (PFS)) for competitive treatment options is presented. **METHODS:** This proposed approach requires patient-level data for one of the treatments and summary data of patient characteristics and survival outcomes for the comparator of interest. Using this proposed method, the researcher would first decide on one or two matching variables that are prognostic for survival, and apply a program involving an extension of a common SAS 9.2 procedure, Proc Surveyselect, to select 1000 random repeated sub-samples from the original population with the same distribution of matched variables. The analysis also requires programming statements using ODS and survival analysis procedures. The median OS or PFS estimates are computed for each bootstrapped sample and a 95% confidence interval (CI) is inferred around the mean of the sampled survival estimates. These absolute survival estimates, based on the adjusted population, can then be compared to the absolute survival estimates reported in published literature of the comparator treatment. **CONCLUSIONS:** In the absence of head-to-head RCT data, an adjusted indirect comparison accounts for observed differences between populations making them more comparable and results in an effect of treatment exposure on survival outcomes that is less likely due to confounders.

CONCEPTUAL PAPERS & RESEARCH ON METHODS – Cost Methods

PMC4

COST ESTIMATION IN HEALTH ECONOMIC EVALUATIONS IN GERMANY: A SYSTEMATIC REVIEW

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OBJECTIVES: The objectives of this study are: 1) to systematically review the methods used in developing cost estimates in the recent German health economic literature; and 2) to examine the methodological approaches in terms of analytical framework, cost components, resource use and cost data sources in light of the national Institute for Quality and Efficiency in Healthcare guidelines. **METHODS:** The MEDLINE database was searched for studies published between 1-Jan-2006 and 31-Dec-2008 estimating direct and/or indirect costs of health care interventions in Germany. Detailed information on the perspective of the analysis, time horizon, resource use categories, costing approach, valuation of resource use, resource use and unit cost/price data sources were systematically collected. **RESULTS:** The literature search returned citations to 122 articles, of which 47 met the inclusion/exclusion criteria. Nearly half of the selected articles (23) adopted the societal perspective and 21 (44.7%) the perspective of German Statutory Health Insurance funds. In nearly three quarters of the studies (35) the time-horizon of the base-case analysis was no longer than one year. Direct medical costs were reported in almost all articles; 25 studies (53.2%) assessed only this cost category. Among the most common unit cost sources of health care services were reimbursement fees for outpatient and hospital services, together with market prices for drugs and medical devices, mentioned in 43 (91.5%)

and 39 (83.0%) articles, respectively. **CONCLUSIONS:** Although the variability in the studies reviewed was very high, some common features emerged. Firstly, most cost estimates focus on direct medical costs only. Secondly, a comprehensive list or at least an exhaustive discussion of the relevant resource use is usually missing. Finally, the time-horizon is often too short to capture all relevant cost drivers and the assessment of the medical resource use not always consistent with the perspective of the analysis.

PMCS

DEVELOPMENT OF A WEB-BASED SOFTWARE TOOL TO EVALUATE THE ECONOMIC IMPACT OF LOST PRODUCTIVITY DUE TO PREMATURE MORTALITY IN DEVELOPED AND EMERGING NATIONS

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OBJECTIVES: Economic analyses that take a societal perspective need to incorporate estimates of lost productivity due to premature death. Such estimates are likely to vary substantially across countries, making it a challenge to assess the value of alternative medical interventions on a global basis. Our goal was to develop a generic, web-based software tool based on rigorous analytic methods that would enable researchers to assess the expected discounted present value of lost productivity for persons who die prematurely at various ages in selected developed and emerging nations. **METHODS:** An analytic model framework was developed to estimate the expected discounted present value of lost productivity due to premature mortality from a societal perspective using a human capital approach (with value attached to household work, as data permitted). Key model inputs included life tables, labor force participation rates, wages, and discount rates. Default input parameter values were based on each country's national statistics, as available, or via generic "global" estimates when such data were lacking. **RESULTS:** Model results were generated for 20 countries around the world, and varied substantially based on patient age at death and the economic region in which a country is located. For illustration purposes, the discounted present values of lost productivity for a person who dies at age 25–29 in the US, Brazil, and Sweden were estimated to be \$US 945,162, 124,795, and 805,740, while the corresponding values for those who die at age 45–49 were 622,248, 76,976, and 480,480. The web-based interface allows researchers to select the country of interest, modify default values, and conduct sensitivity analyses. **CONCLUSIONS:** This generic web-based software tool allows researchers to easily incorporate the value of lost productivity due to premature mortality into economic analyses that take a societal perspective, and provides estimates for many different developed and emerging countries.

PMC6

ASSESSING PRODUCTIVITY AND ACTIVITY IMPAIRMENT DUE TO ILLNESS IN POLAND

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OBJECTIVES: The inclusion of loss productivity costs in pharmacoeconomic studies is still a subject of considerable debate. The aim of this study was to quantify the work impairment due to general health status in Poland with the Productivity and Activity Impairment: General Health (WPAI-GH) Questionnaire. **METHODS:** Data were obtained from a survey that incorporated the WPAI-GH questionnaire and information on burden of care for a sick family member during computer-assisted personal interview in a representative sample of the Polish general population aged more than 15 years. There were 2019 respondents in total, gathered in two waves in January and May 2010. **RESULTS:** The total population comprised 795 subjects in paid jobs. Subjects reported 4.5% work time missed (absenteeism) during the past 7 days. Impairment while at work (presenteeism) amounted to 13.9% of total time. The overall work productivity loss (absenteeism plus presenteeism) equalled 15.2%. Impairment in performing daily activity was 15.6% in the past 7 days. Observed percentages were in general higher in subject from the first wave of study (January 2010) than from second wave (May 2010)—differences did not reach statistical significance. The general tendency of a higher absenteeism and a lower presenteeism values among men than among women were observed. **CONCLUSIONS:** Productivity and Activity Impairment measured by WPAI-GH in the Polish population are similar to these observed in other European countries and the U.S. Moderate differences between values estimated in January and May suggest limited impact of seasonal diseases such as influenza on productivity.

PMC7

TARIFF LISTS FROM SPANISH AUTONOMOUS COMMUNITIES: AN ASSESSMENT OF ITS STRUCTURE, CONTENTS, AND TARIFF LEVELS

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OBJECTIVES: There exists no standardised list of unit costs (UC) for use in economic evaluations in Spain. Tariffs published by the 17 Autonomous Communities (ACs) are often used as a proxy for costs. We explored the structure and contents of AC tariff lists and tariff ranges for common resource use items. **METHODS:** Current tariff lists published in the Official Bulletins from 16 Spanish ACs were retrieved. Tariffs for key health services in the following categories were extracted: specialist and A&E visits, hospitalization, investigations, procedures, laboratory tests, and episodes of care (DRGs). We qualitatively assessed structure and contents of tariff lists, item content for selected items. Ranges, normal mean and weighted mean (according to